

CLAIMS

We claim:

- 5           1. An infrared identification system for  
identifying military vehicles as friendly or hostile,  
comprising:  
            means for introducing trace quantities of a  
seed formulation into the exhaust of a friendly  
10 vehicle; and  
            means for detecting the spectrally-discrete  
thermal emissions of the seed formulation to identify  
the vehicle as friendly.
- 15           2. The identification system as set forth in  
claim 1, wherein the detecting means includes:  
            an infrared detector;  
            an optical lens for collecting and concen-  
trating the infrared radiation onto the infrared  
20 detector;  
            a high-resolution bandpass filter centered  
at a frequency of one of the spectrally-discrete  
thermal emissions of the seed formulation;  
            a threshold trigger; and  
25           indicating means;  
            wherein the threshold trigger activates the  
indicating means when the total energy output by the  
bandpass filter exceeds a predetermined value, there-  
by indicating that the vehicle is friendly.
- 30           3. The identification system as set forth in  
claim 1, wherein the introducing means includes:  
            a pressurized tank for storing the seed  
formulation;  
35           a valve for releasing the seed formulation

from the tank; and

a nozzle for injecting the seed formulation into the exhaust of the vehicle.

5           4. The identification system as set forth in claim 1, wherein the seed formulation is selected from a group consisting of the halides hydrogen chloride (HCl), hydrogen bromide (HBr), hydrogen iodide (HI) and hydrogen fluoride (HF).

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          5. The identification system as set forth in claim 1, wherein the seed formulation is selected from a group consisting of the hydrides sodium hydride (NaH), calcium hydride (CaH) and potassium  
15 hydride (KH).

          6. The identification system as set forth in claim 1, wherein the seed formulation is selected from a group consisting of the oxides beryllium oxide  
20 (BeO), germanium oxide (GeO), magnesium oxide (MgO), selenium oxide (SeO) and aluminum oxide (AlO).

          7. The identification system as set forth in claim 1, wherein the trace quantities of the seed  
25 formulation range in concentration from approximately 0.1 to 2% of the exhaust of the vehicle.

          8. The identification system as set forth in claim 3, wherein the seed formulation is injected  
30 into a combustor of an engine of the vehicle.

          9. The identification system as set forth in claim 3, wherein the seed formulation is injected into the fuel before being burned in an engine of the  
35 vehicle.

10. The identification system as set forth in claim 3, wherein the seed formulation is injected into the exhaust of the vehicle as the exhaust exits the vehicle.

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11. The identification system as set forth in claim 3, wherein the seed formulation is injected into the exhaust of the vehicle only when interrogated by a friendly source.

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12. The identification system as set forth in claim 3, wherein the seed formulation is injected into the exhaust of the vehicle continuously.

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13. A method for identifying military vehicles as friendly or hostile, comprising the steps of:

introducing trace quantities of a seed formulation into the exhaust of a friendly vehicle; and

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detecting the spectrally-discrete thermal emissions of the seed formulation to identify the vehicle as friendly.

14. The identifying method as set forth in claim 13, wherein the step of detecting includes the steps of:

concentrating the infrared radiation onto an infrared detector with an optical lens;

filtering the output of the infrared detector with a high-resolution bandpass filter centered at a frequency of one of the spectrally-discrete thermal emissions; and

indicating that the vehicle is friendly when the total energy output by the bandpass filter exceeds a predetermined value.

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15. The identifying method as set forth in claim 13, wherein the step of introducing includes the steps of:

5 storing the seed formulation in a pressurized tank;

releasing the formulation from the tank with a valve; and

injecting the seed formulation into the exhaust of the vehicle with a nozzle.

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16. The identifying method as set forth in claim 13, wherein the seed formulation is selected from a group consisting of the halides hydrogen chloride (HCl), hydrogen bromide (HBr), hydrogen  
15 iodide (HI) and hydrogen fluoride (HF).

17. The identifying method as set forth in claim 13, wherein the seed formulation is selected from a group consisting of the hydrides sodium  
20 hydride (NaH), calcium hydride (CaH) and potassium hydride (KH).

18. The identifying method as set forth in claim 13, wherein the seed formulation is selected  
25 from a group consisting of the oxides beryllium oxide (BeO), germanium oxide (GeO), magnesium oxide (MgO), selenium oxide (SeO) and aluminum oxide (AlO).

19. The identifying method as set forth in  
30 claim 13, wherein the trace quantities of the seed formulation range in concentration from approximately 0.1 to 2% of the exhaust of the vehicle.

20. The identifying method as set forth in  
35 claim 15, wherein the seed formulation is injected

into a combustor of an engine of the vehicle.

21. The identifying method as set forth in  
claim 15, wherein the seed formulation is injected  
5 into the fuel before being burned in an engine of the  
vehicle.

22. The identifying method as set forth in  
claim 15, wherein the seed formulation is injected  
10 into the exhaust of the vehicle as the exhaust exits  
the vehicle.

23. The identifying method as set forth in  
claim 15, wherein the seed formulation is injected  
15 into the exhaust of the vehicle only when interro-  
gated by a friendly source.

24. The identifying method as set forth in  
claim 15, wherein the seed formulation is injected  
20 into the exhaust of the vehicle continuously.